

Additional ads on page 15

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WANTED: All models of teletype machines, new teletype parts and Northern Radio Converters, type 107. Let me know what you have; I plan on traveling throughout the country and will stop in. Telemechanics, Inc. 85 Shields Ave., Williston Park, N.Y. 11596

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ATTENTION RTTY GROUPS and CLUBS: Have a large quantity of model 15 equipment available. Consists of Model 15 ROs, M 15KSRs, M 19KBDs, (interchangeable with M15 KBD to enable manual send or tape perforation) M 14 type reperfs, M 14 TDs. All less tables and rectifiers. Write or call - K9PSX, E.J. Hokanson, 6517 N. Atwahl Dr., Milwaukee, Wisc. 53209 - (414) 352-2336.

RTTY CONVERTER-CV.278. 450-500 IF input. Will copy wide or narrow shift. Small size, only 5x8x15 D. Need 28VDC power supply. Only \$10.00. Joe Caswell, 2610 Castello Way. Santa Clara, CA 95051

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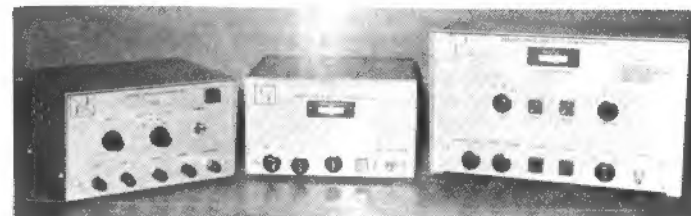
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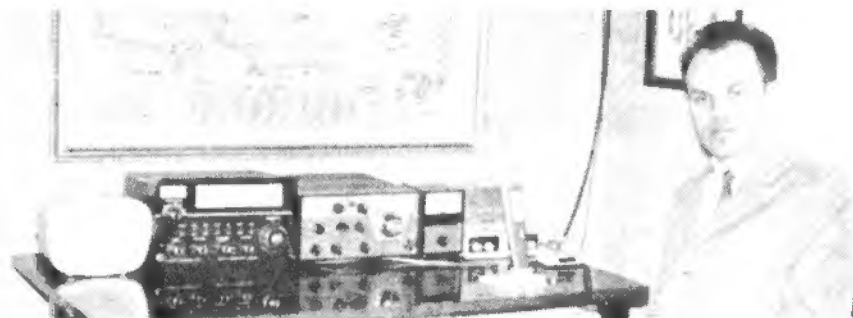
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'Gene' YO2AFB

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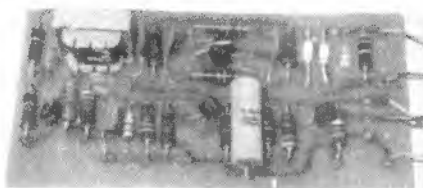


Loop Isolation for I.C. Projects --

Dr. FRANK STEWART, K5ANS

Physics Dept. N L U

MONROE, LA. 71201



Introduction

Recent Motorola Resistor Transistor Logic (RTL) projects such as the Digital Autostart (1), Regenerative Repeater (2), crystal controlled AFSK generator (3) and the Selcal (4, 5, 6) require a method of obtaining mark-space information from the RTTY loop. These units require an input which is "high" (defined as greater than plus one volts) during marking and "low" (defined as less than plus 0.3 volts, or even negative) during spacing. One popular method of obtaining these voltages is to use a resistor (typically either 33 or 47 ohms) in series with the 60 ma loop. The fact that one side of this resistor must be grounded often presents serious switching and modification problems. In addition, one might be plagued with noise and transients.

The Regenerative Repeater obtains its mark-space information through a resistor connected to the keyer driver stage of an ST-3 demodulator. The method requires internal connections to the demodulator, but then the whole project was designed as a demodulator modification. One could drive other RTL projects by this method just as well as the repeater.

It appears to the author that the most convenient way to drive most logic projects is to use an interface that plugs directly into the 60 ma loop anywhere, somewhat as a reperforator, T.D., or even as a second printer. A logic project with such a built-in interface could plug into anyone's loop anywhere, and would be universally useful. The Automatic Printer Control (7) of K3NIO has such a built-in interface, which requires both plus 12 and minus 12 voltages, and uses germanium transistors. An adaptation of this circuit built from surplus computer-board parts, is used in the author's Digital Autostart and Selcals. It requires only a plus 3.6 volt supply.

Sufficient interest has been generated recently in the interface that it was redesigned, using only commonly available standard parts and silicon transistors.

2 MAY 1971

Theory of Operation

The interface is plugged into virtually any 60 ma loop by means of any standard plug. (If a 20 ma loop is used, the 47 ohm resistor should be changed to 100 ohms; this is the only change necessary.) The direction of the loop current through the interface is important; the voltage drop across its input terminals should be about 1.3 volts and of polarity as shown in the diagram.

The first stage is a non-locking a stable multivibrator which generates pulses of frequency approximately 14 Khz. These are transformer-coupled to amplifier Q3. The output of the transformer secondary should be a rather rounded square wave with an amplitude of at least 0.1 to 0.2 volts, peak-to-peak.

Following Q3 is a germanium diode which acts as a DC restorer, or diode clamp; only positive pulses are applied to the base of Q4. These pulses are integrated at the collector of Q4 to give a ramp waveform of low amplitude - approximately one-half volt. This occurs during a RTTY marking condition; during a spacing condition when the astable is not operating there are no pulses at the base of Q4, and the potential at its collector rises to over three volts. Transistor Q5 acts as a switch. During marking its collector is high; during spacing its collector is low. The output of the interface (collector of Q5) drives logic projects directly, and should be connected to their input of "In" terminal.

The Transformer

The most suitable transformer among the dozen the author tested seems to be a miniature audio output transformer with a primary impedance of 500 ohms, and a secondary impedance of 3.2 ohms. The turns ratio equals the square root of the impedance ratio, or 12.5-to-one in this case. Both Radio Shack and Calctro offer this transformer for less than a dollar. Other transformers with a turns ratio between six-to-one and fif-

RTTY JOURNAL

teen-to-one proved satisfactory. These had primary coil windings with a DC resistance between ten-to-40 ohms, and a secondary winding of less than two ohms.

A 1200:8 ohm transformer worked fine. Only barely satisfactory was a 10K:2K transformer, which has a turns ratio of only 2.24-to-one. If the turns ratio is too low, the secondary waveform is very distorted with much "ringing". If the turns ratio is too high, the output voltage is too low.

Discussion

Here are some interesting facts about the interface. Its overall response time is less than one-half millisecond. Therefore, it may be used with 100 wpm RTTY as well as with 60. In addition, the circuit works well with any supply voltage between three and twelve volts; in addition to RTL it can directly drive transistor-transistor-logic (TTL) pro-

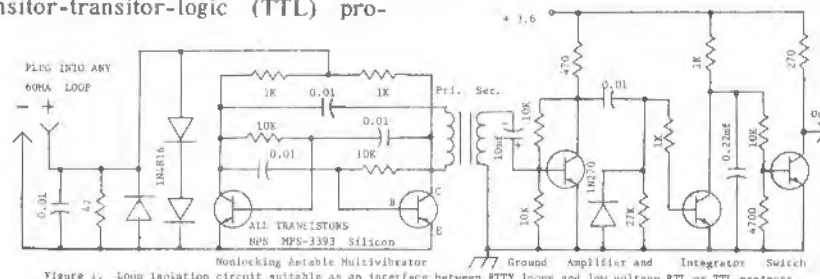


Figure 4. Loop isolation circuit suitable as an interface between RTTY loops and low-voltage RTT or TTL receivers.

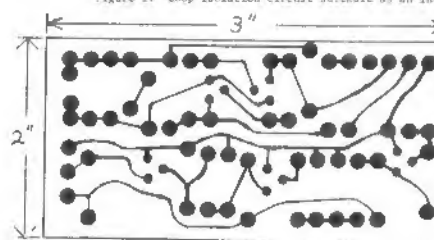


Figure 2. Bottom view (copper foil side) of a suggested printed circuit board layout. The figure is full sized and may be used as a template.

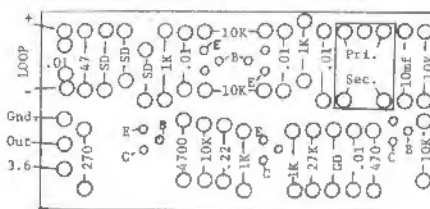


Figure 3. Parts placement for the circuit board. Circles correspond to the foil pads in fig. 2. Components are mounted behind the board as it is viewed here. "SD" denotes any of the three silicon diodes; "GD" denotes the germanium diode.

jects will require 5 volt supplies. The circuit draws approximately 20 ma at 3.6 volts. Only a 2 inch by 3 inch circuit board holds all parts, including the miniature transformer. The interface will permit much greater versatility in the use of the builder's solid state projects, as well as in providing much greater noise immunity. Although the Schematic calls for readily available MPS3393 transistors, practically any low power audio NPN silicon transistor could be used. The cost of all components, if purchased new, is approximately seven dollars.

References

1. RTTY Journal, Nov., 1970
2. RTTY Journal, July-August, 1970
3. RTTY Journal, June, 1970
4. RTTY Journal, May, 1967
5. RTTY Journal, July-August, 1967
6. 73 Magazine, May, 1968
7. RTTY Journal, July, 1964

DX NEWS--

Continued from page 11

Bob, HI8XRM, has a stateside QSL manager as follows --

Vince Buccellato, WA2RSX
927 Brinsmade Ave.
Bronx, N.Y. 10465

A few of the fellows have been fortunate to contact Heinz, TA5KL, on RTTY. He has a very good signal but does not appear to be too active. Nothing further on this one at the moment.

The WAE Contest ought to be happening just about now and we hope that the conditions are improved for this one. It will be the last event until October so you will now have an opportunity to do a thorough maintenance job on those overworked printers. The WAE Contest, with the unique "QTC" message is the only contest that allows utilizing the full capabilities of a complete RTTY system. That is, punching out messages, holding them in storage, and then sending them out at machine speed at a later time.

Good Luck in the Contest.

73 de John

RTTY Station Control and Automatic 'WRU'

IRVIN M. HOFF, W6FFC
12130 Foothill Lane
Los Altos Hills, CA. 94022

PURPOSE --

This circuit allows those using Model 28 teleprinters to have certain automatic station features that offer a tremendous amount of versatility. In addition, it offers automatic "WRU" (who are you?) which is particularly useful on unattended autostart frequencies. It tells the inquiring station if you are copying them, gives them a propagation check to see if the band is open in your direction and is always of immense interest to "visiting firemen" at either end. Protective circuits are included for automatic shut-down in the event something goes wrong.

STATION CONTROL --

This assumes you have a Model 28 printer that you will use. The stunt box will have certain coded sequences in it that will open electrical switches. If you do not use the "WRU" feature, then only S3 and S6 would be used in the stunt box. S3 would be coded to open an electrical contact momentarily upon the completion of the three characters: "Figs Blank H". This would turn the station off the air automatically, as will be explained.

If the two characters "Figs LF (line feed)" are received, this would trip the automatic C.W. identification device.

If the "WRU" feature is added, then an additional seven slots in the stunt box would be used, the completion of which would turn on the auxiliary T.D. with the "WRU" tape in it. That series of seven slots would be programmed with your call letters so it would not operate except when somebody specifically asked for your station. In my case the seven would be: "Ltrs F F C Figs Blank H". (You could even get fancy and have the "C" in this case hit a chimes or bell as it went by, informing you that somebody typed your call -- this would work whether they then added the rest of the sequence or not -- a nice feature if across the room, etc.)

THE CIRCUIT --

The schematic shows 120 VAC for the T.D. magnets. This can be D.C. from the loop supply if you prefer, but this method normally allows you to operate the motor and clutch simultaneously on the auxiliary

T.D. used for "WRU".

You can think in terms of only the left-half of the circuit for the moment.

We use 120 VDC relays for this, which receive their current from the internal loop supply that the 28 machine normally has. If you do not add the remote WRU, it is possible to use a normal 120 VAC relay for K1.

So here we go. To come on the air, you tap the momentary push button S1 -- this puts voltage to the K1 relay coil, which then closes that relay. At this time, the contacts K1a then put voltage through S2 S3 K3a and K1a to the coil, so that the relay becomes a "self-holding type" and stays locked down.

This in turn places the demodulator (T.U.) in standby via K1b and turns the transmitter on via K1d. A manual "off" switch S4 is provided so you can keep the transmitter from turning on in order to run the T.D., etc. for local work.

K1c then puts voltage to the T.D. clutch, allowing it to automatically come on "flying" whenever you push the "start" button (S1). Thus if you have a tape ready to run, all you need do is tap S1 and the transmitter is on the air with the T.D. flying, and no further switches are needed.

We now assume that at the end of the tape we typed a "Figs LF" -- when the tape comes to this point, S6 closes in the stunt box momentarily, starting up the C.W. identification device. That in turn has a relay that holds down until it is finished, one set of contacts on the C.W. relay then opening the voltage to the T.D. via S8 -- turning off the T.D. automatically while the C.W. device (usually a motor-turned code wheel with notches) completes its work. When it has, the T.D. starts up again. At the end of the tape you have typed: "Figs Blank H" and this then operates the stunt-box switch S5 which interrupts the voltage going to the relay coil K1 long enough to allow it to open. This turns off the transmitter, puts the T.U. in receive and stops the T.D. as well.

You can use this same set-up without the T.D. necessarily. You would tap S1 to come on the air -- then go ahead and type manually. You could then either type Figs LF to start up the C.W. device, or tap the manual C.W. tripoff, S5. When the C.W. device was finished, you could then

go off the air by touching the momentary switch S5 or typing "Figs Blank H" to do it via the stunt box and S3.

So much for the station control. All this would only take one relay. It offers in particular the advantage of being able to start a tape by merely touching S1, and at the completion of the tape it would automatically insert the C.W. and then turn the station off the air back to receive. Thus you can start a tape and go mow the lawn or walk in the other room or whatever and it will automatically finish by itself.

This system also gives a "one-switch" control that includes automatic T.D. features.

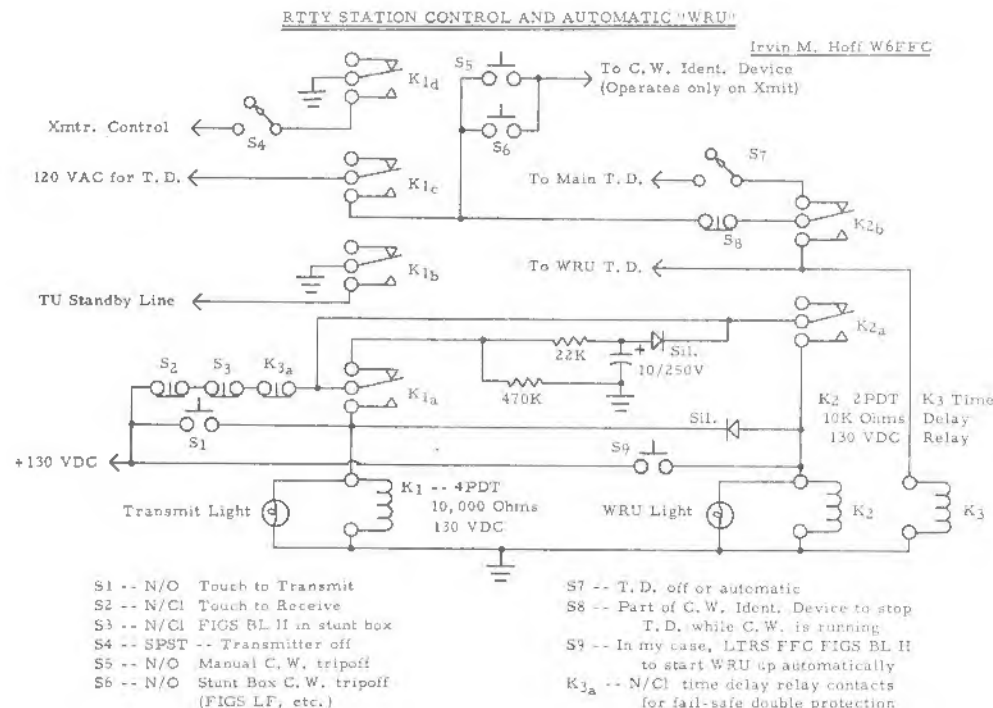
THE WRU PORTION --

We assume only a limited number of people would bother using this feature, since its purpose would necessarily do with unattended autostart either on 80-

10M or on MARS or on 2M, etc.

For the moment we will ignore the capacitor and resistors.

This time we are not on the air, but receiving via autostart. Somebody sends the sequence of characters (in this case the seven characters of "Ltrs F F C Figs Blank H" -- and now the stunt box switch S9 closes momentarily putting voltage on the relay coil K2 -- at the same time this voltage now goes back through the silicon diode and activates relay K1 at the same time, so they both close. K2a holds the second relay down automatically and K1a holds the first relay down, so now both are closed and locked down. Thus the transmitter comes on, the T.U. is in standby and the voltage to the T.D. now is shuttled to the "WRU" T.D. via K2b. (This circuit for "WRU" assumes you have a second T.D. whose sole purpose is for WRU purposes.) At the same time, voltage is now being introduced to K3



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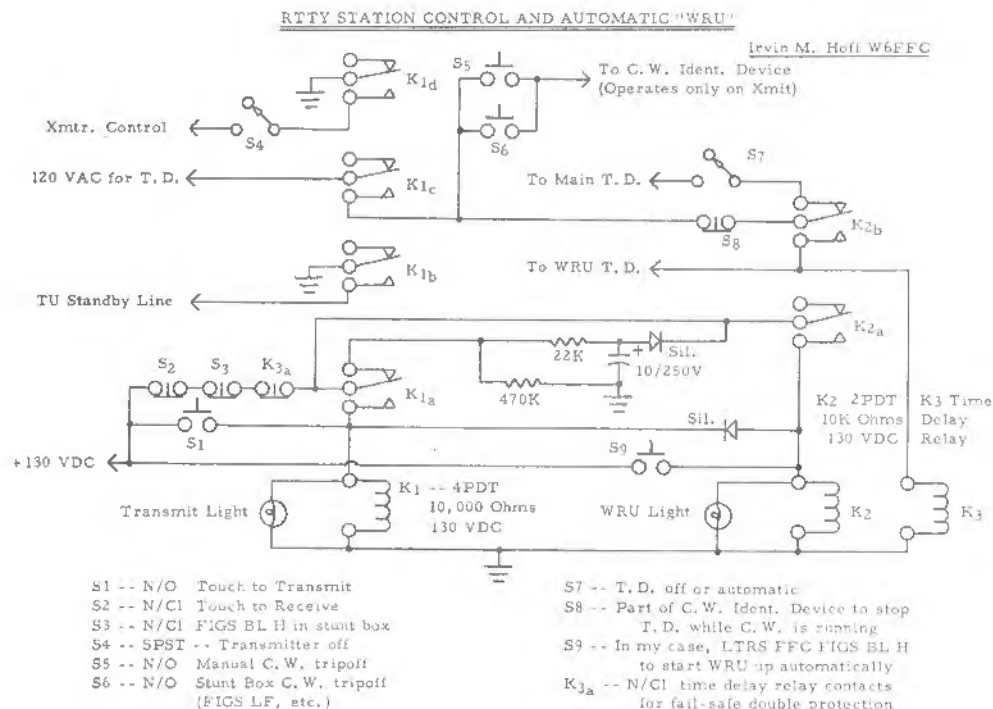
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RTTY theory & applications.

RON 'RG' GUENTZLER, W8BBB

Route 1 Box 30

ADA OHIO, 45810



RTTY TUNING INDICATORS

There has been some call for a discussion of tuning indicators. The following is not meant to be exhaustive, but it will give some thoughts about ways to indicate the tuning status when receiving a RTTY signal.

There are at least three ways to indicate tuning of a receiver when trying to copy a RTTY signal: 1) A display on an oscilloscope of the demodulated signal versus time, 2) A cross as viewed on the face of a cathode ray tube, and 3) A zero indicating meter.

Before discussing how to connect a tuning indicator, a brief discussion of TUs is in order. The figure shows the "heart" of most audio-type TUs.

Basically, the operation is as follows. The tones coming from the receiver are run thru a limiter and amplifier. The audio output from the limiter/amplifier is coupled thru the two resistors, R, into two tuned circuits. The resistors are made fairly high in value to preserve the Q of the tuned circuits and to isolate them as much as possible. One of the tuned circuits is tuned to the Mark frequency and the other to the Space frequency.

Because the tuned circuits are parallel resonant, an audio voltage appears across only one tuned circuit at a time, and only when the frequency of the signal is at or near the resonant frequency of that tuned circuit. Thus, when a Mark tone is received an audio voltage will appear across the Mark tuned circuit and none (or very little) across the Space tuned circuit. When a Space tone is received, just the opposite will occur.

The voltage appearing across a tuned circuit is rectified using the same type voltage doubler commonly used in power supplies. The diodes connected to one tuned circuit are reversed from those on the other tuned circuit. In this example, a Mark tone results in a voltage across the upper tuned circuit and this voltage

gives a positive dc voltage at point X. A Space tone results in an audio voltage across the Space tuned circuit and this results in a negative dc voltage at point X.

The voltage at point X will be a replica of the signal in the transmitting loop at the sending station and will be in polar form. The voltage at this point is used to key the output loop thru a dc amplifier ("keyer" tube or transistor) in a simple TU, or it can be processed thru various circuits such as a low pass filter, a level decision making stage, etc., before keying the output loop.

1) Perhaps the best tuning indicator from the standpoint of obtaining the maximum amount of information about the signal being received employs an oscilloscope arranged to give the demodulated signal as a function of time. For this you will need a dc coupled oscilloscope with a low sweep rate capability and a triggered sweep. The signal displayed will, ideally, be that pictured in a handbook showing a RTTY character. You can obtain such a display by connecting the scope input to point X in the figure. At this point, the signal has not been cleaned up by the circuits within the TU that prepare it for keying the output loop. Therefore, all noise and other forms of trouble making voltages will appear on the display. Perhaps the least desirable feature of this method of tuning is that it will provide a lot of information about the signal, and perhaps too much! One of the most interesting features is that it shows all the "crud" the transmitting station.

2) An oscilloscope can be connected to a TU in such a way that a "cross" pattern results when a RTTY signal is received. Adjust the scope for use with an external horizontal input. Connect the frame of the scope to the "ground" or common point on the TU, the vertical input to point "M" in the diagram, and the horizontal input to point "S".

Because the internal sweep is dis-

abled, an ac voltage applied to the vertical input will give a vertical line; an ac voltage connected to the horizontal input will give a horizontal line. Ideally (for the purpose of scope display), the Q of the tuned circuits in the TU should be as high as possible. When a Mark signal is received, a vertical line will appear on the oscilloscope, because an ac voltage will appear across only the Mark tuned circuit. When a Space tone is received, a horizontal line will appear. If the oscilloscope is properly adjusted, the height of the Mark vertical line will equal the length of the Space horizontal line.

When a RTTY signal is received, the scope will show the horizontal and vertical lines alternately and this will appear as a cross. Once the scope is adjusted to give a proper cross on a properly-tuned signal, you can then use the scope as an aid in tuning a signal.

Several things can cause the pattern on the scope to be other than ideal. The Q of the tuned circuits should be low enough to give proper operation of the TU. This will mean that even when a Space tone that is on frequency is being received, a small voltage will appear across the Mark tuned circuit. Consequently, the horizontal line will actually appear as an ellipse; ditto for a Mark (vertically-oriented ellipse).

When a signal is being tuned in, size, position and shape of the ellipses will change. Once you are familiar with such a tuning indicator the pattern will tell you how well tuned the signal is as well as such things as the shift of the signal being received in relation to the shift to which your TU is adjusted, etc.

3) Because the signal at point "X" is a polar signal, a zero-center meter connected from point "X" to ground will

read approximately zero when a RTTY signal is received and properly tuned. This is somewhat analogous to the zero-center tuning indicator used on some FM receivers. When a steady Mark or Space is being received, the meter will not read zero. Therefore, this type indicator is best for use when a steady, machine speed (tape) signal is being tuned in. A VTVM adjusted for center zero can be used very satisfactorily in this application.

Further information about RTTY tuning indicators can be found in the following references:

RTTY FROM A TO Z, Durward J. Tucker, W5VU, Cowan Publishing Co. (CQ), 1970. p. 180 (Fig. 14.10). pp. 194-198.

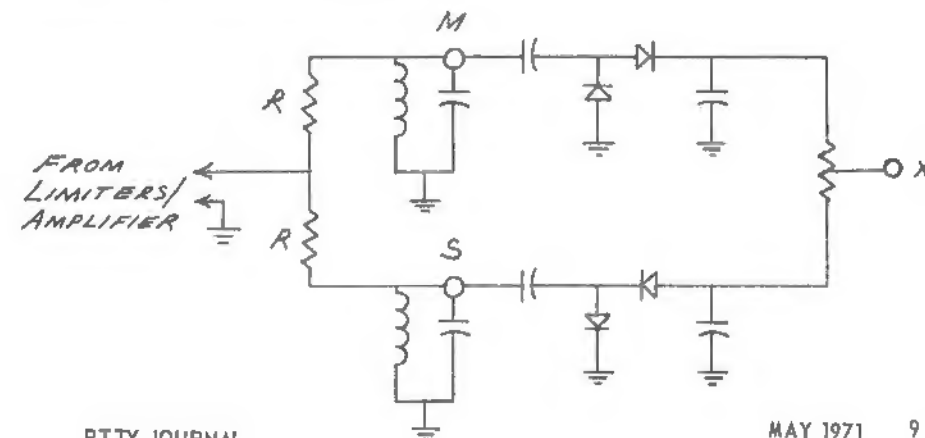
THE NEW RTTY HANDBOOK, Byron H. Kretzman, W2JTP, Cowan Publishing Co. (CQ), 1962, pp. 145-156.

HAM - RTTY W2NSD/1 & W4RWM, 73 Inc., 1963, p. 60. pp. 76-77.

It should be noted that there are two types of "cross-indicators." One type is as described above. The other was omitted because it required some (although very little) additional circuitry. Some of the references cited show how to build a complete RTTY tuning indicator that is independent of the TU. If you do not own an oscilloscope, you can build a special purpose oscilloscope just for RTTY tuning indication. Such a scope is included in some of the references cited.

Another somewhat curious note: The three largest, and best-known amateur handbooks were checked for tuning indicator circuits - there were none!

73 ES CUL (at Dayton?) RG



RTTY-DX

JOHN POSSEHL - W3KV
Box 73 Blue Bell, Pa., 19422



Hello there

The big event last month of course was the Annual Spring Contest sponsored by the BARTG. Activity was quite good as all Continents were represented, however, conditions left something to be desired and were down quite a bit from previous years. Larry, K1LPS, monitored WWV during the Contest and the "official" verdict on conditions was that they started out good at N-7, but then fairly rapidly deteriorated to U-5, where they remained for the duration of the Contest. At this location the only DX contact we made in the first eight hours was with Barney, ZL2ALW, as he was the only station outside the USA that was coming through. Things livened up somewhat later on 20 and 15, but 10 was pretty much of a lost cause except for fairly close-in skip. On this band we never did print Europe, or anything else, for that matter except a short opening directly to the South. If there is a prize given for causing the most frustration, nail biting, rug chewing, or what have you, it should go to Fred, WB0AAO. Those of you that got a crack at him really had a time getting a number and also contending with the fact that Fred could apparently copy only reverse shift. While most TU's have facilities to copy reversed shift or one flips the BFO to the other sideband, sending in reverse is another thing. Anyway, it was great fun while it lasted. A newcomer to RTTY, JA1FFX, was in there to give out numbers from Asia and did a fine job for his first Contest, and considering the fact he was only running about 20 watts input it was really outstanding. Another Contest first was Gerhard, ZS3B, in South-West Africa. Jan, ZS6BBK and Roger, ZS6BKK, made sure that you fellows got a South African contact. From way "down under" you had a good selection from VK3KF, VK3DM, VK2FZ, and ZL2ALW. Henri, FO8BS was in there for what may be one of his last Contests before he leaves Tahiti. South America had a good representation with CE3EX, PY2CBS, PY2DDS, and OA4BR. The bulk of activity of course came from Europe and North America, with a score

10 MAY 1971

DX HONOR ROLL

1. FG7XT	106/98	38. CE3EX	43/34
2. ON4BX	103/97	39. SM4CMG	60/33
3. I1KG	96/90	40. VK3NR	51/33
4. ON4CK	92/86	41. HB9ADM	43/33
5. W3KV	92/84	42. I1CGE	42/33
6. K8YEK	76/74	43. W7VKO	35/33
7. W8CQ	74/70	44. VE4BJ	33/33
8. W4YG	72/66	45. WBQFE	37/31
9. K8QLO	68/61	46. LX2BQ	36/30
10. VE3AYL	63/59	47. K9BJM	32/30
11. W3ISE	63/57	48. HB9AKA	40/29
12. W5QCH	61/57	49. K6EV	33/29
13. KJ6ZBA	75/55	50. WB6ADY	39/28
14. WA6WGL	63/55	51. W3ABT	37/28
15. W1GKJ	62/52	52. VE4FG	34/28
16. I1ROL	60/51	53. W5EUN	33/28
17. W2LFL	59/51	54. ZM2ALW	37/27
18. W4EGY	57/51	55. EI5BH	37/25
19. G6JF	55/51	56. G3IYG	33/25
20. K8JTT	51/47	57. KG6NAA	32/25
21. K4VDM	48/47	58. FY7YQ	29/25
22. W6CG	51/46	59. HK3SO	28/23
23. DJ8BT	51/46	60. PJ2CR	31/22
24. WA2YVK	60/45	61. W2IDX	42/21
25. W9AE	47/42	62. W1KOY	32/21
26. WA8BOT	51/41	63. K6YUI	24/20
27. DK3CU	51/41	64. OZ6OB	33/19
28. W5VJP	42/41	65. WQHAH	32/19
29. SV0WO	47/40	66. W9BT	37/17
30. I1CAQ	43/40	67. DL3NO	20/17
31. W8CAT	41/40	68. WA3IKK	32/16
32. VK3DM	44/38	69. WB6TLA	24/16
33. XE1YJ	41/37	70. CR6CA	28/15
34. VE5LG	42/35	71. HP1XHG	24/15
35. DL8VX	42/35	72. I1THB	22/15
36. WB6RXM	44/34	73. K1LPS	25/12
37. I1WT	43/34	74. WA8SJM	15/3

of multipliers available. I suppose that we will not be able to look forward to much better conditions in future Contests. In fact, they should tend to get worse, especially on the higher frequencies as the Sun Spot cycle goes through its natural change. Perhaps this means trying to figure out larger and more efficient sky wires for 80 and 40 meters in the not too distant future.

Early in March the long awaited activity from Roumania commenced with the signal of Eugen, YO2AFB, on RTTY.

RTTY JOURNAL

He is putting out an excellent signal and I am sure that many of you have him in your logs by this time. We all certainly appreciate the efforts of Uli, DK3CU for getting Eugen started. You can send QSL's direct to --

Eugen Badea
P.O. Box 14
Hateg, Roumania

By the time you read this, Fanie, ZS2MI, will have closed down and returned to South Africa. Whether his replacement will take an interest in RTTY remains to be seen, and if so, it will be some time before we hear from this spot again. We certainly appreciate the efforts of Jan and Joey, ZS6BBK/BBL for their assistance in giving many of the RTTY boys an opportunity to make a contact with Marion Island. Jan tells us that ZD9BR, a new chap on Gough Island, is one to keep a lookout for these days. Be prepared for 50 baud operation for this one.

QSL's have been coming thru from FH8CE in recent weeks to you fortunate ones that had a contact with Hugues in his somewhat brief operation from the Comoro Islands. We are now happy to report some future RTTY possibilities from the same general area. We are indebted to Jerry, K1PLP, Ass't. Technical Editor, ARRL, for passing us the following information. Andre, FR7ZX, Reunion Island, presently has a TU and AFSK generator and with an old Creed machine, (receive only) borrowed from the local broadcast station he can receive RTTY when he has use of the machine. He is extremely interested in getting on the mode but of course there are no machines available in the area. If anyone has a serviceable machine gathering dust I'm sure that Andre will put it to good use. You can get in touch with him as follows:

Andre Delmarle, FR7ZX
Chemin Crepu
Bras Panon, (97.4) Reunion Is.

Dusty writes of a letter from Colex K5OLU, stating that he has arrived at Kwajalein and has also received all his gear including a 28KSR and should be ready to go as soon as his new KX6 call arrives. Watch for him especially on Sundays as he is working on a 6 day a week job.

Those of you that have been on RTTY for a few years well remember Cas, KA9AK, when he was the only station active from Japan and at a time when the only authorized activity for RTTY was above 29 mhz. Cas was always active in the Contests and at that time was, more

often than not, the only Asian station on RTTY. From Eric, VK3KF, who maintained skeds with him in those days, we hear that Cas is now stationed at Fort Bragg, N.C. and at the moment is trying to get set up on RTTY. Eric plans to maintain weekly skeds at 1300z, Sundays, On about 14090 khz. I'm sure that there are many of you that would like to BK and say hello to Cas again after these few years.

Congratulations are in order to the following stations upon receiving the W A C Award this month.

Nr. 154 Mark Thompson W5EUN
Nr. 155 Lucien Vuilleumier HB9ADM

For Mark, this comes right on the heels of his W A S achievement of last month, and for Lucien it is a double honor. Our records show that he is the FIRST Swiss station to have WAC-RTTY.

Lucien also tells us that the Swiss Amateur Radio Teleprinter Group (Swiss ARTG) was founded on January 17, 1971. Chairman, HB9P, and Secretary, HB9GS. We will be happy to pass along information on future activities of the Group as we receive them.

In mid-March Bud, W2LFL, has short but enjoyable contacts with OZ6OB and SMSQV, but with out the usual QRM and QSB. Both Ole and Gunnar were in New York briefly on their way to the West Coast and Bud was fortunate to have a chat with both of them. The visits were about a week apart so I don't think that the two had a chance to meet. It would be an interesting story if their paths did cross. Ole was in the San Diego area for a week but we are not sure as to where Gunnar was at. Anyway, we hope that both had a pleasant visit to the States.

Although there has been no activity from Liberia in recent months, the next best thing would be a contact with EL0Y/MM. He was recently printed while about 300 miles west of the Azores with an excellent narrow shift signal.

You Canadian boys may be interested in knowing that Gerhard, ZS3B, is looking for a VE contact. He has been very active the short path around 2000z and also via long path at about 12-1300z, real landline copy too.

Dave, 3A2CZ, has been showing increased activity lately and puts a good signal into the States from a Heath HX-10 and a TA-33 Jr. Dave is with Trans-World Radio in Monte Carlo and QSL's can reach him at --

David E. Fisher
"Le Continental"
Monte Carlo, Monaco
Continued on page 3

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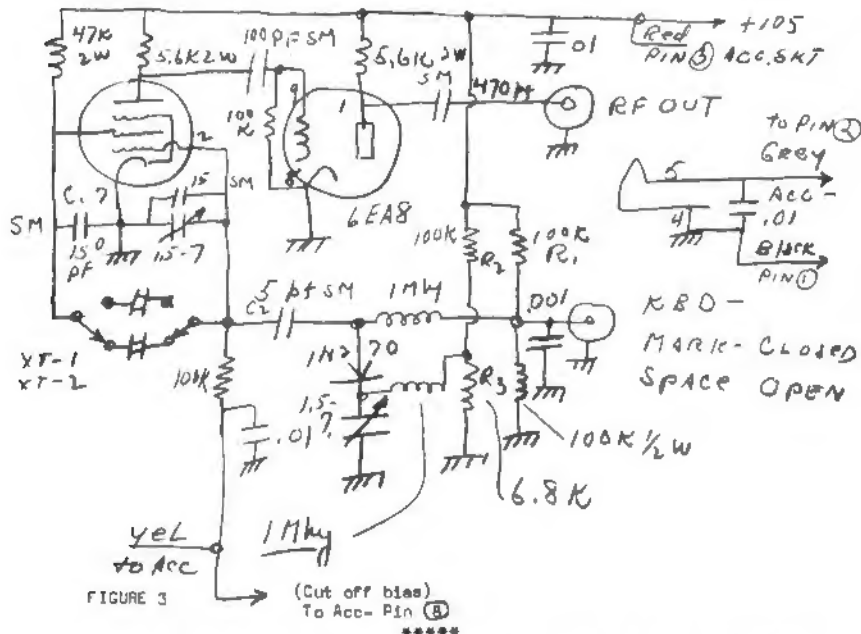
MAY 1971 11

The Unit described is a two fre-

box twice this size would be more applicable as the switch takes up considerable room.

40 Meter Xtel.		
XT1- 7.037450 - Adj. OK.	14075.000	HA700
XT2- 7.055000	14074.828	

SM- Silver Mica
Kever is wired like this...



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RTTY, Introduction to (K6JFP)	p. 38, June
RTTY converter, Miniature IC (K9MRL)	p. 40, May
Short circuit	p. 80, Aug.
Swan 350 & 400 equip- ment on RTTY (HN)	p. 67, Aug.

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Precise tuning with ssb gear
W0KD
Synchronphase RTTY reception
W6FOO p. 38, Nov.
Synchronphase afsk oscillator
W6FOO p. 30, Dec.
Teleprinters, new look in
W6JTT p. 38, July
1971
Mainline ST-6 RTTY
demodulator p. 6, Jan.
Short Circuit p. 72, April
Troubleshooting the ST-6 RTTY
demodulator p. 50, Feb.
RTTY signal generator p. 23, March

Newt, K8QLO has a number of E15 QSL cards for stateside contacts. A SASE envelope to 572 Ludwig, Detroit, Mich. 48224 will bring you a card if you are looking for one.

CLASSIFIED ADS Rates-\$1.- 30words. ADDITIONAL Words 3c ea.

CLOSING DATE FOR ADS- 1st of month....

SB-401 w/crystals. SB-301 w/cw filter, \$500 for pair. Will sell separately. Very nice TT/L-2. Model 15 printer. 2 model 14 reperf, model 14TD all on custom table with super station control. Many other non-RTTY items. S.A.S.E. for complete description. WB4RKA. R. Wanat, 443 Atlas Drive, Madison, Alabama 35758

PARTS - ALL MACHINES - fast service on all machines from 14s thru 35s. SASE for list. Sell Fred your surplus TTY for highest cash or trade. Typetronics, Box 8873, Ft. Lauderdale, Fla. 33310 W4NYE

MORE RTTY! THAT'S RIGHT. In 1970 there were more feature RTTY articles in HAM RADIO Magazine than any other general amateur magazine. You need RTTY Journal, but you need HAM RADIO also. \$6.00 per year; \$12.00, 3 years. Ham Radio, Greenville, N.H. 03048

TOROID COILS, 88 mh UNCASSED. 5 for \$2.00
postpaid U.S. H. R. Fasold, PO Box 375, Apple
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SALE: TELE-TYPEWRITER SIGNAL DISTORTION TEST SET TS2/TG transmits four test signals, R, Y, space or standard test message. Portable in wooden chest, manual and wiring diagram included. Used good, \$32.00 each. Telfax Facsimile Transceiver; desk type, W.V. model 600 SA, simple to wire back to back for landline use or over a VHF audio frequency shift hook-up. O A dim. 12x13x7 1/2 inch drum, synchronous drum motor, running condition, used good, \$11.00 each. Atlantic Surplus Sales, 580 3rd Ave., Brooklyn, N.Y. 11215

WANTED: INPUT FILTER FOR AN/FGC-29 multiplex channel 5 or 12 receiver, fre. 2125 cps. Also station and frequency lists of commercial and press services. Bruce Jaquish, 23333 Edsel Ford, St. Clair Shores, MI. 48080

HAL DEVICES - RTTY EQUIPMENT Now, a single-source for BOTH parts and circuit boards for Mainline RTTY Equipment. Recently added to the HAL/ Mainline series - the HAL-AK - AFSK Oscillator parts kit for \$27.50. The HAL AK-1 features a new circuit board (same size and using the plug-in connector as in the ST-6) and 15 turn potentiometers for precise adjustment of the tones for 170 and 850 Hz shift. Other proven HAL Devices RTTY Equipment: HAL ST-5 TU Parts Kit - \$50.00 (with HAL circuit boards, meter, and meter components. HAL ST-6 TU Parts Kit - \$135.00 (Now supplied with meter, lamps, and associated parts). Screened, but not drilled cabinet for ST-6 - \$26.00. Wired ST-6 Terminal Units - write. HAL RT-1 Solid State TU/AFSK generator - \$51.50 (with cabinet) Write for complete details on these and other HAL products and parts - look for us at the Dayton Hamvention. HAL DEVICES, Box 365 RJ, Urbana, Ill. 61801

BACK ISSUES - RTTY JOURNAL - Have all issues from Vol. 1, No. 1, will reproduce any issue for \$1.00 PP. \$1.10 first class. John Isaacs, 3175 Val Verde Ave., Long Beach, Cal. 90808

WANTED: TECHNICAL MANUAL FOR TT-230 FG, (part of an FG-30) and miniature #28 typing reperfector. Also need keyer module for CV-89 RTTY converter. **FOR SALE**, teletype oil and special purpose oiler with long flexible spout, \$1.25 postpaid. **Haines B. Remmes**, 1530 Bancroft St., San Diego, CA 92102

EPOXY DIODES - 1000 Volt PIV at 1.5 Amp, 24¢ each pzd. 88 Mhz Centertapped unpotted toroids \$1.50 for 5 pzd. Send stamp for list. M. WEINSCHENKER BOX 353 IRWIN, PA 15642.

M28ASR 100 wpm \$825. M19 60 wpm \$135., other electronic odd lots. New list twice a month. Send SASE to CFP Enterprises, 10 Graham Rd., W., Ithaca, NY 14850.

SELLING OUT WAREHOUSE FULL of teletype & facsimile machines, parts and equipment. Loads of electronic equipment and computers. No fair and reasonable offer refused. No list or catalogs available. Saturday or Sunday by appointment. Week days 10-4. Goodman, 5826 S. Western Ave., Chicago, Ill. 60636. (312) GR 5-8200.

POTTING COMPOUND FOR TOROIDS, etc. 1/2 pint kit includes dispensing tube, actuator, mixing tools. Hardens in a few hours 35¢ per kit. Amplifier Modulator AM879/FRC contains tubes, trans, pots, coils etc. Best buy on the market. Large quantity in stock only \$3.00 postpaid. Over 10,000 items in stock, write - all inquiries answered. Bob - Frank Electronics, 407 Ritter Rd., Harrisburg, Pa. 17109

FOR SALE: TMC CFA-1 TU, excellent, with manual, \$120 - ST-57 90% complete, 170/850, scope & meter, \$175 - ST-5, 95% complete, \$65 - 28LPR typing reperf, 3-speed, mint condition, with cover, \$150, - Eimac SK500 (4-1000) socket, new, \$15 - Vacuum variables, 375 pf/16KV, 1/4" drive, \$25 - All FOB - SASE for further information & equipment list. Wanted: Ham M & TH6DXX, L. L. Filby K1LPS, P.O. Box 47, Peacham, Vermont 05862

TOROIDS: LOWEST PRICE ANYWHERE. 40/\$10. POSTPAID. (\$5/\$2.00) 44 or 88 mhy center tapped. 32KSR Page printer, reconditioned, perfect; \$225. MITE UG41KSR Page printer, perfect; \$250. Mod28 Sprocket to Friction Kit \$25. 28LBDX TD \$70. 28LPR reperf with gear shift; \$170. 33 parity Keyboard with cables, excellent; \$38. Model 15KSR, reconditioned; \$65. Matching RA87 P.S., Unused; \$7. Lorenz 15KSR, newest, many features; \$75. Sync motors \$7. GEARS for most machines: List for stamp. 14TD \$20. DPE tape punch \$14. HP2000 Audio Oscillator \$95. R309UR receiver \$550. 11/16" tape; 40rolls/\$10.00. 33ASR, complete, excellent; \$700. Stamp for complete listing. Van WDLT 302R Passaic Stirling, N.J. 07980

SPACE-ONE DELUX RTTY DEMODULATOR completely solid state. Choice of three shifts 850-170-425, sharp Butterworth bandpass input filters, linear discriminators, motor control, lowpass filter 60-75-100 wpm, anti space, choice of fast or slow auto start, meter tuning, mark and space indicator lamps, standby & receive lamps, AM or FM operation, proven heavy duty TT/L-2 loop supply (adjustable), regulated power supply, plus and minus FSK driving voltages (adjustable), provisions for disabling auto start & motor control, normal reverse switch, can be supplied with low or high tones, Desk type cabinet or rack mounted. Introductory offer \$250.00 FOB. Can be supplied with J & J deluxe AFSK generator low distortion-high output generator built into the same cabinet making the unit self contained at an additional cost of \$75.00 or a total of \$325.00 FOB. J & J Electronics, Canterbury, Conn. 06331.

SALE: Model 19 with no glare window. Model 14 reperf. and keyboard, Model 14 Tape Dist. audio TU & scope and meter indicators, line unit, everything \$200. W6JX, 14945 Dickens St., Sherman Oaks, CA 91403.

Additional Classified on Page 16

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